

***Gorgasia thamani*, a New Species of Garden Eel from Fiji  
(Teleostei: Congridae: Heterocongrinae)**

David W. Greenfield<sup>1,3</sup> and Sean Niesz<sup>2</sup>

<sup>1</sup> California Academy of Sciences, 875 Howard Street, San Francisco, California 94103;

<sup>2</sup> Department of Zoology, University of Hawaii, Honolulu, Hawaii 96822.

A very elongate garden eel, *Gorgasia thamani*, is described from Koro Island, Fiji. The new species is most similar to *G. barnesi*, known from the Philippines, Papua New Guinea, and the Solomon Islands, but differs by being more slender with a shorter head and mouth and a different head pore pattern.

While conducting a survey of the marine fishes of Fiji, a colony of very elongate garden eels was discovered at the west side of Koro Island, Fiji, off Kade Village on a fine sand bottom in 14 to 15.2 m of water. The species, although similar in appearance and length to *G. barnesi*, differs from that species in a number of characters and is described here. *Gorgasia barnesi* is known from Indonesia, the Philippines, Papua New Guinea, and the Solomon Islands.

The new species is placed in the genus *Gorgasia* because the upper lip is not confluent medially across the face of the snout, the anterior nostrils and ethmoid sensory pores are separate from the upper lip, and the mouth is relatively large and slightly oblique, its angle reaching to below anterior half of eye, characters not present in the only other genus in the subfamily, *Heteroconger*.

MATERIALS AND METHODS

Information for the holotype is presented first, followed by the range and mean or mode for all type material. All measurements are presented first as thousandths of total length, and then again as either percentage of snout-anus length or percentage of head length for comparison with data presented in Castle and Randall (1999). Methods of counting and measuring follow Castle and Randall (1999), who followed Böhlke (1989), Smith (1989) and McCosker et al. (1989). Institutional abbreviations are as listed in Leviton et al. (1985).

SPECIES DESCRIPTION

***Gorgasia thamani* Greenfield and Niesz, sp. nov.**

(Figs. 1–5)

**MATERIAL EXAMINED.**—HOLOTYPE: CAS 219365, 1101.4 mm TL, Fiji, Koro Island, west side off Kade Village, 17°21.261'S, 179°22.435'E, sand, 14–15.2 m, 10 November 2002, field number G02-164, collected by D.W. Greenfield, K.R. Longenecker, K.S. Cole and R.C. Langston. PARATYPES: all collected with holotype: BPBM 39441, 1186 mm TL; FMNH 113585, 1180 mm TL;

<sup>3</sup> Research Associate, Department of Ichthyology, California Academy of Sciences and Emeritus Professor, University of Hawaii. Mailing address: Moss Landing Marine Laboratory, 8272 Moss Landing Road, Moss Landing, CA 95039.

USNM 376279, 1185 mm TL; BM(NH) 2004.4.8.1, 1053 mm TL; AMS I.43260-001, 913 mm TL; NSMT-P68327, 831 mm TL; SAIAB 74101, 776 mm TL; CAS 219366 (2), 705–752 mm TL.

OTHER MATERIAL COLLECTED WITH THE TYPE SERIES — CAS 219367 (29), 680–1141 mm TL.

ADDITIONAL MATERIAL EXAMINED — *Gorgasia barnesi*: Indonesia, Ambon: BPBM 36482(7) 422–1209 mm TL.

**DIAGNOSIS.**— An elongate, slender species of *Gorgasia* (depth at gills 0.69–0.91 percent total length) having 41–44 preanal pores, 69–75 preanal vertebrae, 213–225 total vertebrae, head pores POM 6+2 and ST 1+2, head 9.2–10.9 percent of snout-anus length, and mouth length 2.7–3.2 percent of snout-anus length.

**DESCRIPTION.**— Vertebral formula 7/69/213, 6–8 (usually 7), 69–75, 213–225. Lateral-line pores before anus 41, 41–44 (usually 42–44). Total lateral-line pores 120, 118–123 (usually 122). Pectoral-fin rays 13, 11–13 (usually 11). Dorsal rays before anus 167 (holotype only). Total dorsal-fin rays 571 and total anal-fin rays 381 in holotype. Head pores in holotype SO 1 + 4, IO 2 + 4, POM 6 + 2, ST 1 + 2. Proportions as thousandths of total length: snout-anus length 262.2 (262.2–318.0; 295.1); head length 28 (26.6–34.6; 29.3); snout length 5.3 (4.8–6.3; 5.3); eye diameter 5.2 (4.5–7.9; 5.7); gill opening 2.7 (2.5–3.3; 2.9); pectoral-fin length 4.1 (3.9–6.0; 4.6); depth at gill opening 7.2 (6.9–9.1; 7.9); depth at anus 4.8 (4.8–8.8; 6.8); front of upper jaw to rictus 8.4 (7.7–9.9; 8.8); front of upper jaw to end of maxilla 10.3 (9.5–14.7; 10.7). Proportions as percent of snout-anus length: head length 10.7 (9.2–10.9; 9.9); predorsal length 11.7 (9.1–11.7; 10.6). Proportions as percent of head length: snout length 18.9 (17.5–20.3; 18.6); eye diameter 18.6 (17.0–23.0; 19.8); front of upper jaw to rictus 3.2 (2.7–3.2; 3.0); gill opening 9.7 (9.0–11.8; 9.9); pectoral-fin length 14.7 (12.6–18.7; 16.0); depth at gills 25.6 (25.2–31.9; 27.4); depth at anus 17.0 (17.0–28.8; 23.4).

Color of fresh specimen: Background coloration gray, paler anteriorly and ventrally on head.

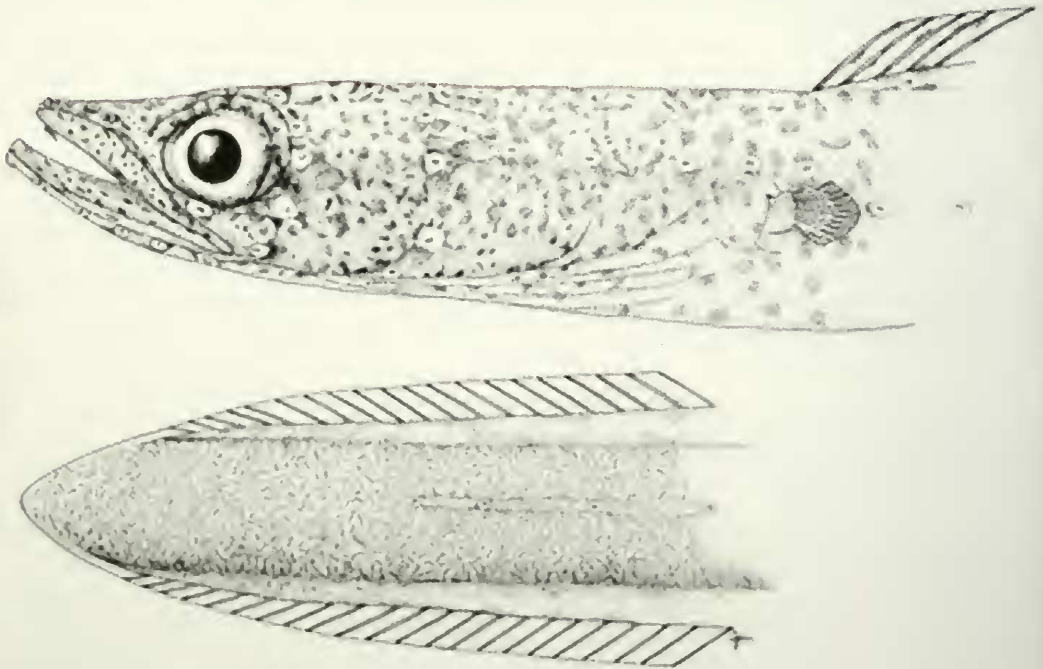


FIGURE 1. Holotype of *Gorgasia thamani*, CAS 219365.

Body covered with dense, irregular, brown spots; tip of tail and snout almost solid brown. Brown spots less dense ventrally on head and on pectoral fins. Pores on head and anterior portion of lateral line within distinct white spots. Pupil black; iris light yellow.

Color in alcohol: Background coloration mottled brown-gray; body covered with dense, irregular brown spots. Tip of tail light brown. Jaws and underside of head cream with scattered brown spots. Pores on head and anterior portion of lateral line within distinct white spots. Pupil of eye white; iris black.

**ETYMOLOGY.**—Named in honor of Dr.

Randolph R. Thaman, Professor of Pacific Islands Biogeography at the University of the South Pacific in Fiji, who has provided unending assistance to us in arranging for the Survey of Marine Fishes Project funded by the National Science Foundation. Without Dr. Thaman's assistance this project literally would not have been possible. In addition, Dr. Thaman is a leader in promoting conservation measures in Fiji, both terrestrial and marine.

**COMPARISONS.**—*Gorgasia thamani* is most similar to *G. barnesi* Robinson and Lancraft, and keys to that species using Castle and Randall (1999) because of its high total vertebral and lateral-line pore counts and coloration. It also is a large species, our largest specimen is 1185.8 mm, whereas the largest specimen of *G. barnesi* examined by Castle and Randall (1999) was 1212 mm, the largest known for a garden eel. It differs from *G. barnesi*, however, by being a more slender, elongate species, with the depth at the gills 0.69–0.91 percent of total length versus 1.1–1.6 in *G. barnesi* (Fig. 3). It also has a shorter head length, 9.2–10.9 versus 11.2–14.1 percent of snout-anus length (Fig. 4). The mouth, as measured by front of upper jaw to rictus, is shorter in *G. thamani*, 2.7–3.2 percent of snout-anus length, versus greater than 3.6 in *G. barnesi* (Fig. 5). Head pores are POM 6+2 and ST 1+2 in *G. thamani* versus POM 5+4 and ST 2+1 in *G. barnesi*.

#### ACKNOWLEDGMENTS

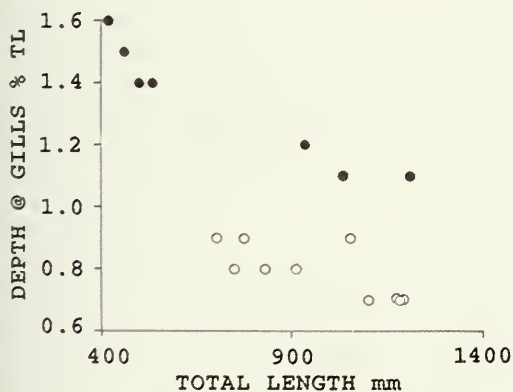


FIGURE 3. Body depth at gills as percentage of total length, open circles = *Gorgasia thamani*, closed circles = *Gorgasia barnesi*.

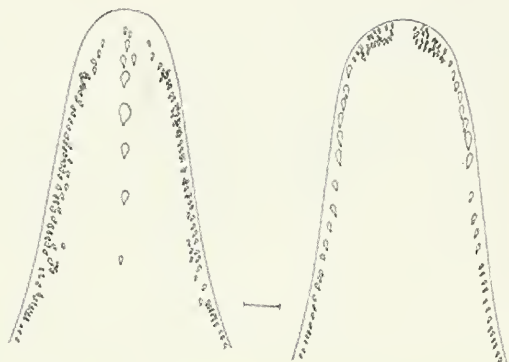


FIGURE 2. Dentition of holotype of *Gorgasia thamani*, upper jaw on left.

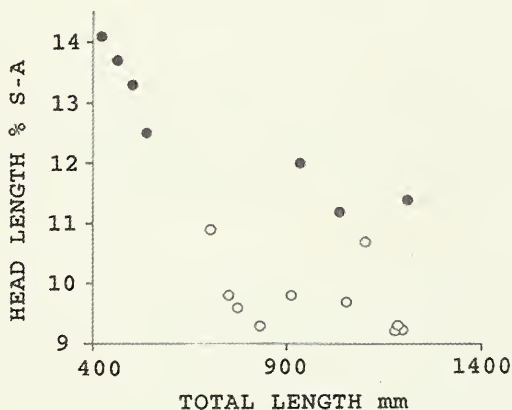


FIGURE 4. Head length as percentage of snout-anus length, open circles = *Gorgasia thamani*, closed circles = *Gorgasia barnesi*.

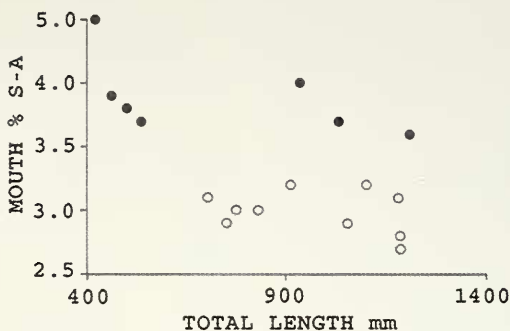


FIGURE 5. Mouth length as percentage of snout-anus length, open circles = *Gorgasia thamani*, closed circles = *Gorgasia barnesi*.

We would like to thank K.R. Longenecker, K.S. Cole, and R.C. Langston for assistance in collecting specimens, and Captain B. Vasconcellos and the crew of the *Moku Moku Hine* for assistance in the field. We are grateful to J. Seeto, G.R. South, R.R. Thaman, and R.W. Tuxton of the University of the South Pacific, Fiji for facilitating our collecting in Fiji. We also thank the Fijian Government and local village chiefs for permission to collect fishes. Special thanks are due Susan Monden for drawing the figures. This research was supported by National Science Foundation grants INT97-29666 and DEB0-1027545, and Sea Grant Project R/FM-6PD.

#### LITERATURE CITED

- BÖHLKE, E.B. 1989. Methods and terminology. Pages 1-7 in E.B. Böhlke, ed., *Fishes of the Western North Atlantic*, Part Nine, Volume One. *Orders Anguilliformes and Saccopharyngiformes*. Sears Foundation for Marine Research, New Haven, Conn.
- CASTLE, P.H.J., AND J.E. RANDALL. 1999. Revision of Indo-Pacific garden eels (Congridae: Heterocongrinae), with descriptions of five new species. *Indo-Pacific Fishes* (30):1-52.
- LEVITON, A.E., R.H. GIBBS, JR., E. HEAL, AND C.E. DAWSON. 1985. Standards in herpetology and ichthyology. Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia* 1985:802-832.
- MCCOSKER, J.E., E.B. BÖHLKE, AND J.E. BÖHLKE. 1989. Family Ophichthidae. Pages 254-412 in E.B. Böhlke, ed., *Fishes of the Western North Atlantic*, Part Nine, Volume One. *Orders Anguilliformes and Saccopharyngiformes*. Sears Foundation for Marine Research, New Haven, Conn.
- SMITH, D.G. 1989. Family Congridae. Pages 460-567 in E.B. Böhlke, ed., *Fishes of the Western North Atlantic*, Part Nine, Volume One. *Orders Anguilliformes and Saccopharyngiformes*. Sears Foundation for Marine Research, New Haven, Conn.